1.0 Purpose and Need

Chapter 1 presents the United States (U.S.) Department of Energy (DOE), National Nuclear Security Administration's (NNSA) [1] requirements under the *National Environmental Policy Act of 1969* (NEPA), background information on the proposal, the purpose and need for agency action, and a summary of public involvement activities.

1.1 Introduction

NEPA requires Federal agency officials to consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, DOE and NNSA follow the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500-1508 (40 CFR 1500-1508)) and DOE's NEPA implementing procedures (10 CFR 1021). The purpose of an environmental assessment (EA) is to provide Federal decision makers with sufficient evidence and analysis to determine whether to prepare an environmental impact statement or issue a Finding of No Significant Impact.

At this time, the NNSA is considering the implementation of a corrective measure at Material Disposal Area (MDA) H within Technical Area (TA) 54 at Los Alamos National Laboratory (LANL). LANL is a Federal facility located at Los Alamos, New Mexico (Figure 1), that comprises about 40 square miles (mi^2) (103.6 square kilometers [km^2]) of buildings, structures, and forested land. The facility is administered by NNSA for the Federal government, and managed and operated under contract by the University of California (UC). This EA has been prepared to assess the potential environmental consequences of implementing a corrective measure at MDA H and a No Action Alternative.

The objectives of this EA are to (1) describe the underlying purpose and need for DOE, NNSA action; (2) describe the Proposed Action and identify and describe any reasonable alternatives that satisfy the purpose and need for Agency Action; (3) describe baseline environmental conditions at LANL's TA-54; (4) analyze the potential indirect, direct, and cumulative effects to the existing environment from implementation of the Proposed Action, and (5) compare the effects of the Proposed Action with the No Action Alternative and other reasonable alternatives.

For the purposes of compliance with NEPA, reasonable alternatives are identified as being those that meet NNSA's purpose and need for action by virtue of timeliness, appropriate technology, and applicability to LANL. The EA process provides NNSA with environmental information that can be used in developing mitigative actions, if necessary, to minimize or avoid potential adverse effects to the quality of the human environment and natural ecosystems should NNSA decide to proceed with the Proposed Action of implementing a corrective measure at MDA H. Ultimately, the goal of NEPA, and this EA, is to aid NNSA officials in making decisions based on an understanding of environmental consequences and in taking actions that protect, restore, and enhance the environment.

[1] The NNSA is a separately organized agency within the DOE established by the 1999 *National Nuclear Security Administration Act* (Title 32 of the *Defense Authorization Act* for fiscal year (FY) 2000 [Public Law 106-65]).

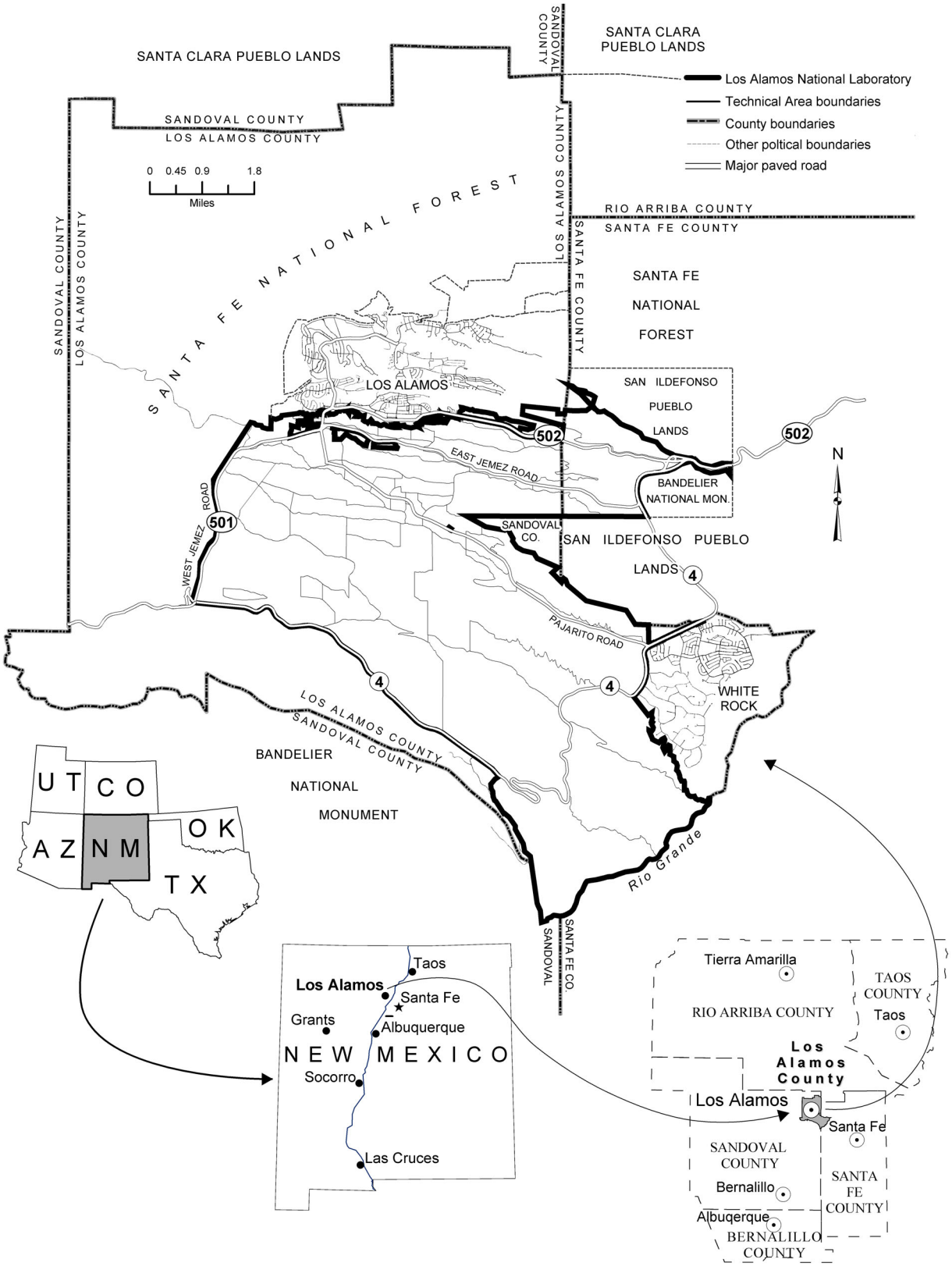

Figure 1. Location of Los Alamos National Laboratory.

1.2 Background

LANL is located in north-central New Mexico within a region characterized by forested areas with mountains, canyons, and valleys, as well as diverse cultures and ecosystems. The Federal government agency with administrative responsibility for LANL has evolved from the post-World War II Atomic Energy Commission, to the Energy Research and Development Administration, and finally to the DOE, NNSA. UC is the current LANL Management and Operating Contractor and has served in this capacity since the facility's inception in 1943.

TA-54 is located in the east-central portion of LANL (Figure 2) on Mesita del Buey between Pajarito Canyon (south) and Cañada del Buey (north). During the late 1950s, this technical area was chosen to serve as a consolidated radioactive and chemical waste treatment, storage, and disposal (TSD) site for LANL. Wastes generated at various other LANL technical areas were to be managed at this single waste management site, rather than managed at various sites scattered over LANL near their generation locations as was the prior practice. Current storage activities at TA-54 for *Resource Conservation and Recovery Act*- (RCRA-) regulated hazardous and mixed wastes are conducted under the administrative authority of DOE, the U.S. Environmental Protection Agency (EPA), and the New Mexico Environment Department (NMED).

There are four designated areas at TA-54 used for the TSD of solid[2], sensitive (classified[3]), hazardous[4], radioactive, or mixed[5] waste generated at LANL. Two of these areas are active and contain a number of solid waste management units (SWMUs); these two areas are known as Areas G and L. The other two areas are inactive and are known as MDAs H and J. Classified solid-form wastes were disposed of at MDA H from May 1960 through August 1986. MDA J was used from 1961 until 2001 to dispose of industrial solid waste. Area L was used for the disposal of liquid chemical wastes from 1964 until 1985 and is now used to receive, store, and ship toxic, hazardous, and mixed radioactive wastes to permitted offsite disposal facilities; and Area G, which has been in use since 1957, is used principally for the disposal of solid low-level radioactive waste (LLW)[6] and for the storage of TRU[7] wastes.

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[2] Solid waste, as defined in 40 CFR 261.2 and in 20 New Mexico Administrative Code (NMAC) 9.1, is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

[3] Classified waste includes all types of classified items such as classified documents, parts, shapes, molds, computers, or computer media that could provide information that must be protected in the interest of national security, as authorized under Executive Order 12958 or any superseding order; Restricted Data classified under the *Atomic Energy Act of 1954*, as amended; or Formerly Restricted Data.

[4] Hazardous waste, as defined in 40 CFR 261.3, which addresses RCRA regulations, and by reference in 20 NMAC 4.1, is waste that meets any of the following criteria: a) waste exhibits *any* of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity, or toxicity; b) waste is specifically *listed* as being hazardous in one of the four tables in Subpart D of the CFR; c) waste is a mixture of a *listed* hazardous waste item and a nonhazardous waste; d) waste has been *declared* to be hazardous by the generator.

[5] Mixed waste is defined as any waste containing both hazardous and source, special nuclear, or by-product materials subject to the *Atomic Energy Act of 1954*.

[6] LLW is radioactive waste that is not high-level waste, spent nuclear fuel, transuranic (TRU) waste, by-product material (as defined in Section 11e.(2) of the *Atomic Energy Act of 1954*, as amended), or naturally occurring radioactive material (DOE 2001).

[7] TRU waste is radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the EPA, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61 (DOE 2001).

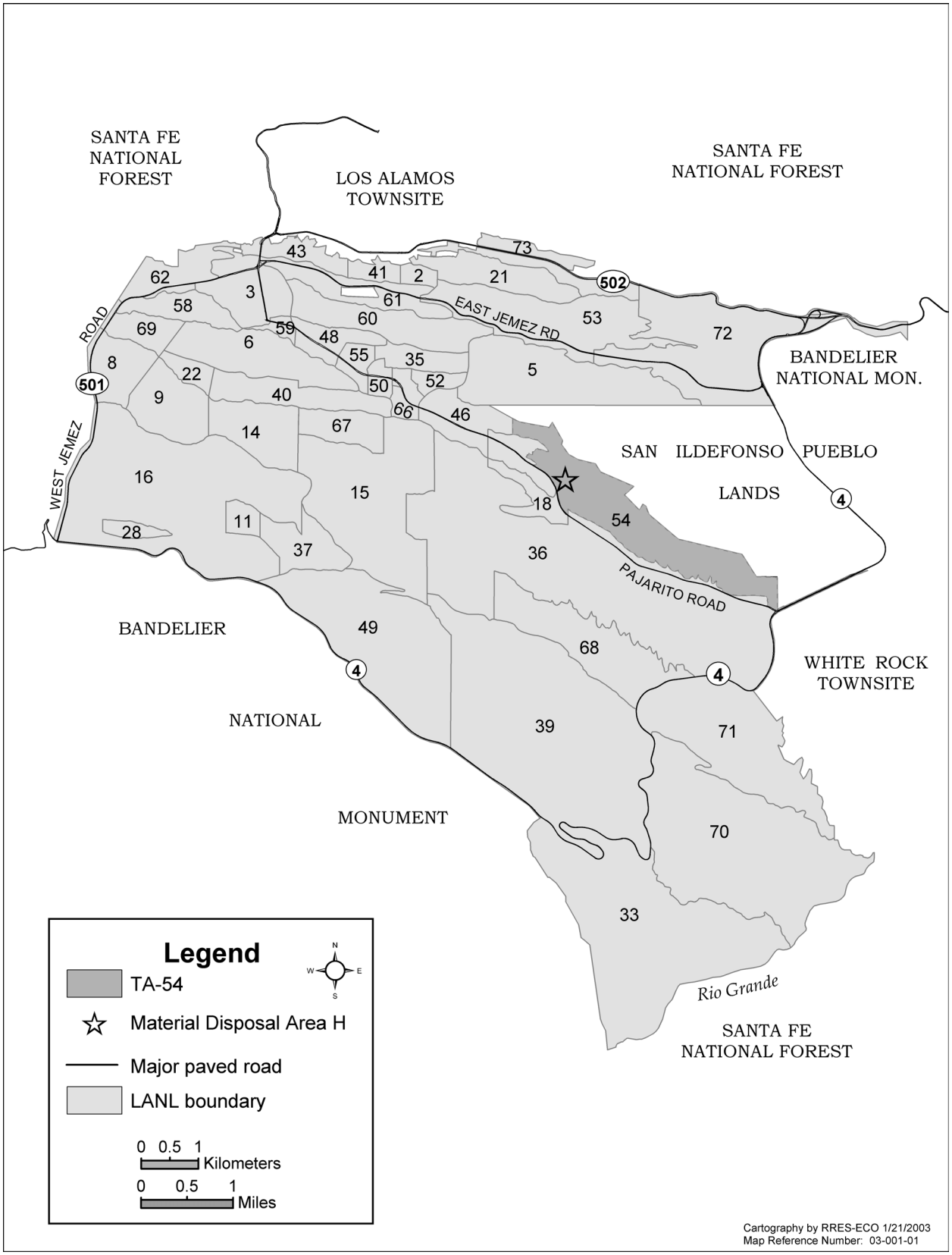

Figure 2. Location of MDA H within TA-54.

MDA H is a relatively small, fenced site about 70 feet (ft) (21 meters [m]) by 200 ft (60 m), (0.3 acres [ac] [0.12 hectares (ha)]) in size, consisting of nine inactive vertical in-ground shafts arranged in a row (Figure 3). Between 1960 and 1986, the site was used for the burial of classified solid-form wastes, and containerized and non-containerized solid-form wastes, some of which were residually contaminated with radioactive, hazardous, and high-explosives (HE) constituents.

Disposals at MDA H were recorded in a logbook, which contained a brief description of the waste and an approximate weight. These descriptions include sufficient information to identify, with some degree of certainty, the types of hazardous waste and radionuclides placed in the shafts. However, the exact amount of waste has not been absolutely quantified. A major component of waste placed in the subsurface shafts at MDA H was radioactive metal, of which half was either indicated in the logbook to be depleted uranium (DU) or postulated to be DU. A small percentage of the waste at MDA H was recording media (such as paper documents, film, slides, and magnetic computer tapes). Graphite is also present in the waste inventory. The RCRA-regulated hazardous waste component of the MDA H inventory includes lithium hydride (a reactive compound) and HE. In addition, phthalate-containing plastics are present, as is tritium. Details of the MDA H disposal inventory can be found in the MDA H Corrective Measures Study (CMS) Report, Appendix B (LANL 2003), discussed later in the text of this EA.

Because of the inventory of radioactive material contained in MDA H, it is regulated as a nuclear facility under DOE's nuclear safety management regulations (10 CFR 830). The current regulatory basis for analyzing and addressing the management of radioactive wastes at LANL is contained in DOE Orders 435.1, "Radioactive Waste Management," (DOE 2001) and 5400.5, "Radiation Protection of the Public and the Environment" (DOE 1993a). These DOE orders, together with RCRA, the *New Mexico Hazardous Waste Act* and the New Mexico Solid Waste Management Regulations (all three of which govern the disposal of hazardous wastes), regulate both the short-term and long-term management (including disposal by in-ground burial) of radioactive and hazardous wastes at LANL. These laws, regulations, and DOE orders were not in effect at the time TA-54 started to receive wastes; before the 1960s, the *Atomic Energy Act of 1954* (42 United States Code [USC] 2001) contained the only provisions applicable to radioactive or hazardous waste management and disposal at LANL. No regulatory requirements were in effect during the 1960s that required new waste disposal sites to be either lined or monitored, as are currently required by the laws and regulations governing new buried waste disposal sites today.

The regulatory basis for analyzing and addressing the management of hazardous waste is RCRA. Pursuant to the RCRA corrective action requirements, a RCRA facility assessment (an initial site assessment) of MDA H and other potential release sites (PRSs) at LANL was completed in 1990 (LANL 1990a); a RCRA facility investigation (RFI) (LANL 2001a) and addendum for MDA H (LANL 2002a) was completed in 2002. NMED approved the RFI report and addendum on April 11, 2003.

Section VIII.L of LANL's Hazardous Waste Facility Permit (EPA 1994, 1990) requires that "(I)f the Administrative Authority has reason to believe that a SWMU has released concentrations of hazardous wastes, or if the Administrative Authority determines that contaminants present a threat to human health and the environment given site-specific exposure conditions, or may

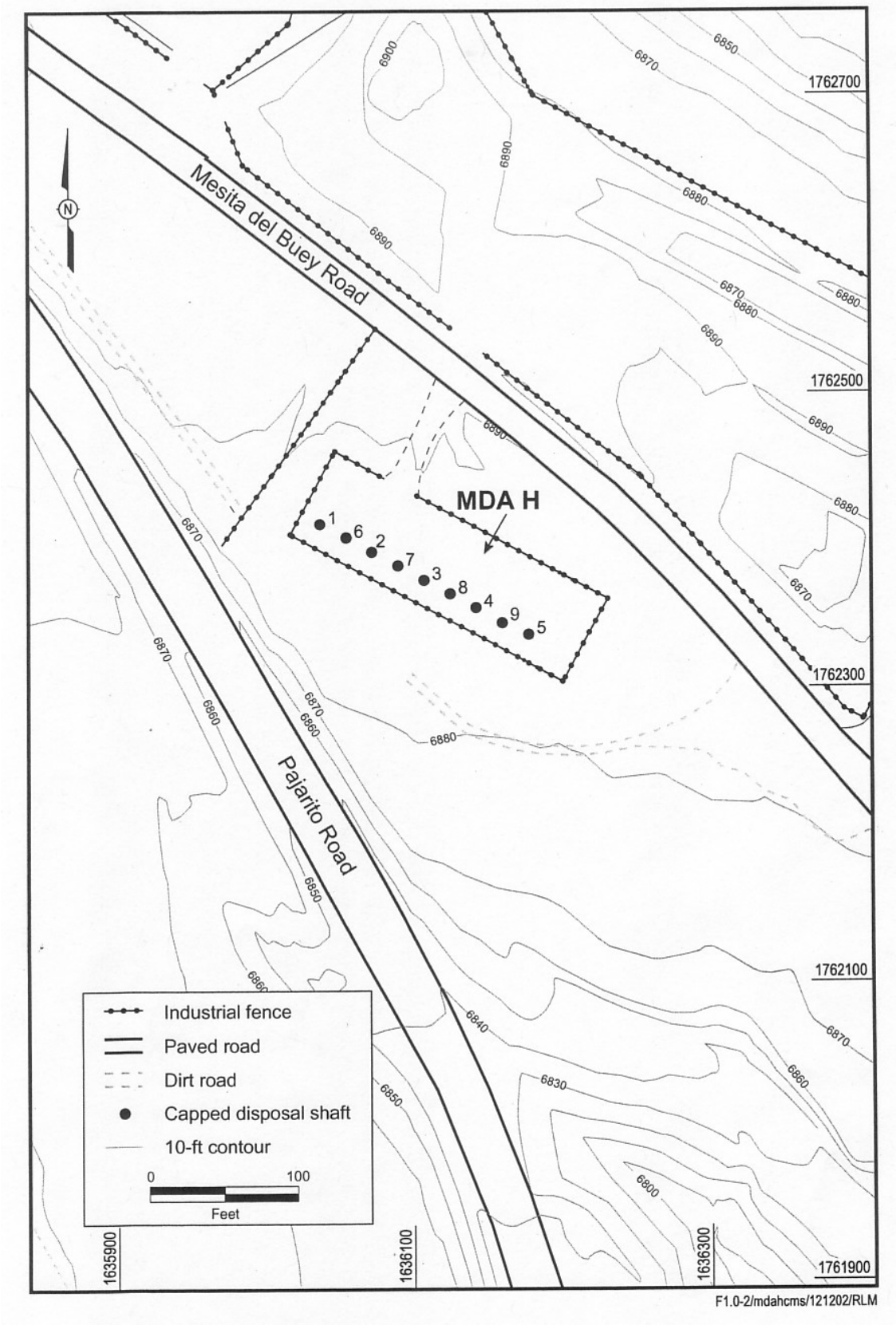

Figure 3. Locations of inactive disposal shafts at MDA H.

Resource Conservation and Recovery Act Corrective Action Process

Resource Conservation and Recovery Act **(RCRA):** RCRA extends environmental protection to the land. This law sets forth an intent to promote conservation of resources through reduced reliance on landfilling. Both solid waste and hazardous waste are covered by this law. In RCRA, Congress established initial directives and guidelines for EPA to regulate hazardous wastes from generation to ultimate disposal. In 1984, Congress amended RCRA by passing the Hazardous and Solid Waste Amendments **(HSWA)**. In accordance with these provisions of HSWA, LANL's permit to operate hazardous waste treatment and storage units includes a section (called Module VIII or the "**HSWA Module**") that prescribes a specific corrective action program for LANL, which focuses primarily on the investigation and cleanup, if required, of inactive sites.

The HSWA Module specifies the following three-step corrective action process:

1. **RCRA Facility Investigation (RFI):** An RFI identifies the nature and extent of contamination at its source and the environmental pathways along which contaminants could travel to human and environmental receptors. This step characterizes the extent of contamination in the detail necessary to determine which corrective measure options could be effective in reducing any potential future adverse effects to human health and the environment from contaminant releases at a disposal site as a result of either intentional or unintentional disposal of wastes (such as from site spills or leaks). Characterization focuses on answering questions relevant to determining further actions in a cost-effective manner.

2. **Corrective Measures Study (CMS):** If characterization indicates that corrective measures are needed, a CMS evaluates potential corrective measure options that address potential unacceptable future risks and recommends one or more of those measures for implementation. These options are evaluated based on their projected ability to reduce risks to human and environmental health and safety in a cost-effective manner. Corrective measures considered in a CMS include monitoring components to confirm the effectiveness of the corrective measure option and define actions to be taken in the event that the corrective measure option implemented is ineffective.

3. **Corrective Measures Implementation (CMI):** A CMI implements the selected corrective measure option, verifies its effectiveness, and establishes ongoing control and monitoring requirements, if needed.

present a threat over the lifetime of the wastes, the Administrative Authority may require a CMS and shall notify the permittee in writing." NMED, as the regulatory Administrative Authority for RCRA-regulated hazardous waste in New Mexico, determined that MDA H wastes could present such a future threat to human health and the environment and informed DOE and UC in a letter dated December 27, 2000, of the need to prepare a CMS (Young 2000).

The CMS Report (LANL 2003) was subsequently developed for MDA H; both hazardous waste constituents and radioactive waste constituents were considered in the CMS. The MDA H CMS Report describes the evaluation and decision approaches used to demonstrate the need for, and the components of, various corrective measures that would be suitably protective of human health and the environment with regard to the long-term management of these wastes and also identifies a preferred corrective measure for the wastes present at MDA H. The MDA H CMS Report is based on EPA, NMED, and DOE human health and environmental dose and risk assessment guidance. At its conclusion, the MDA H CMS is fully documented in a report (LANL 2003) available for public review and comment. The final selection of the corrective measure option to be implemented is made by the NMED. To ensure continued compliance with RCRA and the *New Mexico Hazardous Waste Act* requirement, both pre-construction approval and approval of the CMI Plan would be requested of NMED at the same time. The CMI Plan would include all components of the corrective measure action, including all staging areas, waste handling areas, and other support structures required to implement the corrective measure activity. NMED would approve all the engineering drawings, specifications, and the adequacy of other relevant information before any corrective measure option selected by NMED could be undertaken. DOE, NNSA must now make a decision on implementing a corrective measure for MDA H.

1.3 Purpose and Need for Agency Action

DOE, NNSA has the Congressionally assigned responsibility for the administration of LANL, including the management of radioactive and hazardous wastes generated by LANL mission support activities. As a result of historical LANL waste disposal practices, wastes disposed of within shafts at MDA H have been identified by NMED as potentially having a future adverse effect on human health and the environment. A CMS Report prepared for MDA H evaluated various corrective measure options for MDA H. DOE now needs to implement a corrective measure for MDA H so as to comply with the legal requirements of RCRA and the *Atomic Energy Act of 1954*.

1.4 Scope of This EA

A sliding-scale approach (DOE 1993b) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. That is, certain aspects of the Proposed Action have a greater potential for creating environmental effects than others; therefore, they are discussed in greater detail in this EA than those aspects of the action that have little potential for effect. For example, implementation of the Proposed Action could affect waste management resources at LANL. This EA, therefore, presents in-depth descriptive information on these resources to the fullest extent necessary for effects analysis. On the other hand, implementation of the Proposed Action would cause no effect on threatened and endangered species at LANL. Thus, a minimal description of effects to this resource is presented.

When details about an action alternative are incomplete, as a few are for the action alternatives evaluated in this EA, a bounding analysis is often used to assess potential effects. When this approach is used, reasonable maximum assumptions are made regarding potential aspects of project activities (see Sections 2.0 and 3.0 of the EA). Such an analysis usually provides an overestimation of potential effects. In addition, any proposed future action(s) that exceeds the assumptions (the bounds of this effects analysis) would not be allowed until an additional NEPA

review could be performed. A decision to proceed or not with the action(s) would then be made. For example, groundwater remediation, if required, would be the subject of additional NEPA review.

1.5 Public Involvement

NNSA provided written notification of this NEPA review to the State of New Mexico, the four Accord Pueblos (San Ildefonso, Santa Clara, Jemez, and Cochiti), Acoma Pueblo, the Mescalero Apache Tribe, and to over 30 stakeholders in the area on December 13, 2002. In addition, upon release of this draft EA, NNSA will allow for a 30-day comment period. Where appropriate and to the extent practicable, concerns and comments will be considered in the final EA.

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